

mand that we get a dollar's value for each dollar spent by Federal agencies. Following along with this thought, last year I asked you if any constituent had been identified in cigarette smoke since the Surgeon General's report of 1964, that had been found to be responsible for any human disease and you said you didn't know. My question is: Now that you have spent another \$7 million in the field of biomedical research, can you illuminate us as to any constituent which can be identified as being responsible for any human disease?

Dr. STEWART. Mr. Hull, at the present time, what we are doing is trying to identify all the constituents in cigarette smoke and in the gaseous phase which are carcinogenic. We have a long list of those which are potential causes of carcinoma in human beings, and which are cytotoxic and produce changes in cells and in animals which are compatible with being carcinogenic. We have not identified the item in cigarette smoke or in the gaseous phase. I would like also to point out that we are beginning to think that there may be some potentiation of items in the cigarette smoke and items in the environment which lead to it rather than being a single item. It may be a multiplicity of items. I think we will spend a lot more money before we have identified the specific elements of cigarette smoke or the gaseous part of the cigarette smoke as the etiological substance which causes lung cancer in human beings.

Mr. HULL. That leads me on to this question. Last year I inquired if there were any specific agents in cigarette smoke which could be pointed to as the cause of lung cancer and you said there was not. Presumably you have spent a great deal of money over the past year in pursuit of this elusive—if existent—agent and I ask you, Can you report that you have finally located such an agent?

Dr. STEWART. No; but I think that the question is not quite what the answer was. I think we have many agents in cigarette smoke which are highly probable as being the etiological agents of lung cancer. But I cannot say this specific item is it.

NICOTINE

Mr. HULL. The 1964 Surgeon General's report on smoking stated, at page 32, that nicotine was not an important health hazard and, at page 75, stated that nicotine probably does not represent a significant health problem. Last year when you were asked about this to determine whether there had been any change in scientific thought about nicotine, you indicated that there was a review being conducted by the PHS of the current research and that the review would be issued when it was completed. Has the review been completed and can you now tell us if you can give us some concrete information along this line?

Dr. STEWART. Yes. The review is the report that was sent to the Congress as required by law last year, which brings up to date the scientific evidence that has developed since the 1964 review. There is one interesting study reported in there which lends one to have some concern about nicotine. It has not been confirmed to my knowledge in the scientific literature at the present time but it is an interesting lead. There is one study that reports that the nicotine increases the oxygen demand of heart muscle. This is a very interesting

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finding, if this is so, because it could possibly link nicotine to cardiovascular diseases. Again, I say this is just an addition. We also know that some of the properties that cause physiological dependence on cigarettes are in the nicotine area. There has also been some research done on the enzymes which handle the nicotine in the body, and the ability to characterize smokers and nonsmokers as having different enzymes. There has been some progress made on nicotine since the 1964 report. I think the conclusion of the 1964 report was correct with the evidence that was available. But I think we need to pursue it a lot further in the scientific realm before we could draw any other conclusion than what was in the 1964 report.

Mr. HULL. In other words, we will spend probably several million in an effort to establish nicotine as a health hazard notwithstanding the 1964 report?

Dr. STEWART. I think what we are doing is we are spending several millions to find what it is that makes cigarettes hazardous to health. In exploring this we will be looking at the hydrocarbons, the gases, the tars, and the nicotine. We are looking at all avenues. It seems to me with the 55,000 lung cancer deaths and a rising rate of lung cancer deaths—

Mr. HULL. Do you attribute that to smoking?

Dr. STEWART. I think we attribute very much of it to smoking cigarettes.

Mr. HULL. How much?

Dr. STEWART. One cannot say, but it looks, as if, from the data we have, it is the major contributing factor to the cause of lung cancer.

The conclusion of the 1964 report was that it was a cause-and-effect relationship between cigarette smoking and lung cancer.

SURVEYS ON SMOKING

Mr. HULL. Dr. Stewart, last year we had information to the effect that the National Clearinghouse had awarded contracts totaling over half a million dollars sending people around to try to determine what people think about smoking. Similar surveys have been conducted since last year's hearings. Assuming that such questions can be a productive or useful field of inquiry, which I do not, can you now tell us if the PHS has discovered how people feel about smoking?

Dr. STEWART. Yes, we have had some additional information about how people feel about smoking, what was the reason for the rise in filter cigarettes. Also, much more important, and we have concentrated much more on this as to why people smoke cigarettes. We have found that there are a variety of types of smokers: some who are addicted, some who are psychologically dependent, some who are in a social environment where this is a social part of the picture, some who are physiologically dependent. We did not know this before. We thought all cigarette smokers were more or less alike. The later information has broad implications on trying to develop programs to help cigarette smokers become nonsmokers.

Mr. HULL. Dr. Stewart, you have been spending all this money trying to find out what people think about smoking and what makes them smoke or not smoke and you have been spending a great deal of money trying to get the American people to see things your way.

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